CHARNLEY

HINTS ON PRESERVING AND MOUNTING BIRDS

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BY

J. R. CHARNLEY,

Author of
"A Handbook of British Butterflies," &c.

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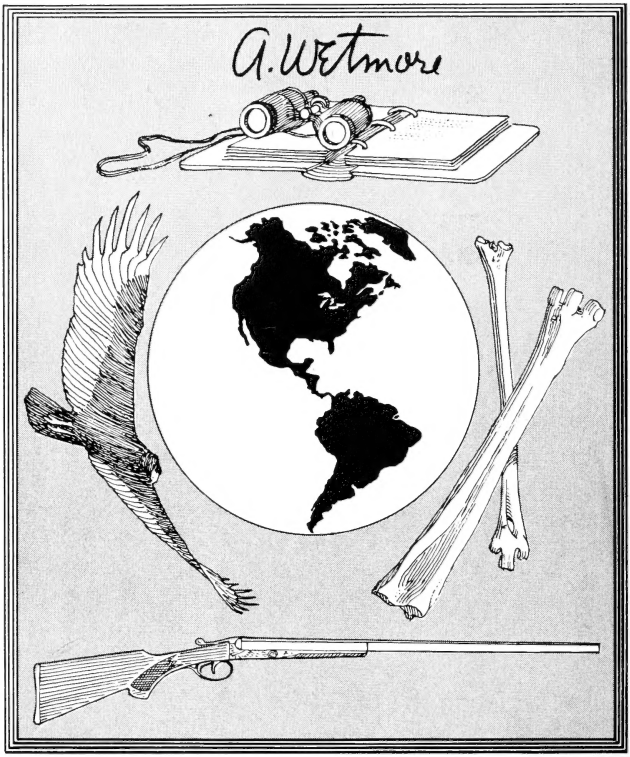

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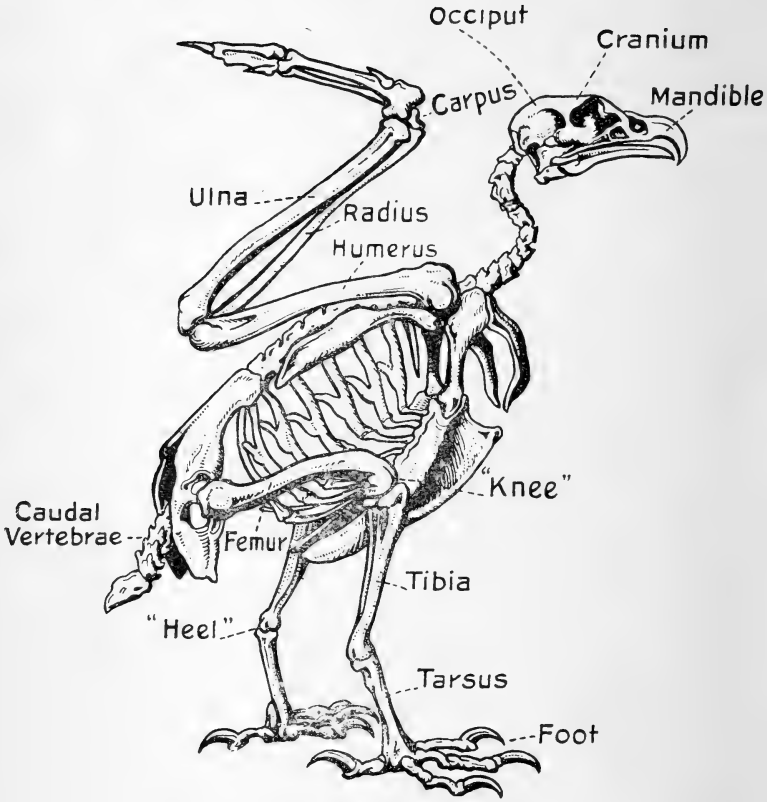

SKELETON OF GOLDEN EAGLE, showing anatomical parts referred to in the text.

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Chapter I.

INTRODUCTION.

This little handbook is expressly intended to serve as guide for the amateur bird collector, desirous of preserving and mounting his own specimens.

In these days of ultra-civilization, when it has become the fashion in some quarters to scoff at the idea of bird-collecting, a book on bird-preserving will not unlikely be received with some misgiving; and if any apology is needed for the appearance of the present volume, let it be that in spite of the abuse that has been showered upon the bird collector in recent years, he still flourishes in most parts of the country, and moreover, is likely to continue so long as the sporting elements inherent in every healthy British boy endure; for after all, it is, as Mr. E. C. Arnold has remarked, out of the schoolboy and his catapult in most instances that the great naturalist is eventually evolved. Happily for Britain, the old sporting spirit, which has done so much to establish the race in its present position amongst the nations of the earth is still strong at home, and shows no signs of abating.

Looked at from any angle, the wholesale slaughter of birds must be condemned by every thoughtful man, and all good sportsmen involuntarily recoil in disgust from a record of butchery, miscalled sport.

The true sportsman, however, never kills for the mere lust of killing, and never wastes his "game." The recklessness of a few men, who style themselves naturalists, is sufficient to damn a whole crowd of unoffending persons in the eyes of certain prejudiced people; and in this connection, the tendency in some circles to confuse the genuine amateur with the professional collector, is the more deplorable, as the difference, so far as the harm wrought by each to bird life is concerned, is very considerable.

No ornithologist, worthy of the name, has any sympathy with the professional, who follows his bent, purely from monetary motives, and besides carrying on an indiscriminate system of egging, slaughters rare and beautiful birds at random, so long as the natural history and millinery establishments afford him a market for his goods. It is this type of collector, along with that frequently misguided individual the game-keeper, and a certain class of shore shooter, that the birds have most to fear. The gamekeeper on most preserves is out to kill every bird of prey that comes within gunshot, with the result that some of our raptorial species are now on the brink of extinction, and so long as game preservers sanction, or permit, this kind of slaughter the extermination of these birds is merely a question of time.

The shore shooter's object is mainly big bags. It is a not uncommon sight on some parts of the coast in early autumn, when the great wave of migration has set in, to see shore shooters empty

both barrels into a dense flock of Waders, a proceeding, which to say the least of it, is highly unsportsmanlike, and can only be described as sheer butchery. The worst feature about this so-called sport, is that in addition to the number of birds actually killed, many others "carry on" as cripples and die. When a swivel-gun is, for want of better quarry, discharged at a flock of shore birds, the result, of course, is infinitely worse.

The practice of shooting such birds, for example, as the Bearded Tit, Dartford Warbler, Raven, and others of their class, some of which are becoming increasingly rare, while others only retain a precarious footing in these Islands, cannot be too strongly condemned. On the other hand, the avifauna of the country is not likely to suffer material loss by the taking of accidental stragglers which visit our shores from time to time, since they are never likely to establish themselves in this country, and are not, in the true sense of the word, British birds. The shooting of these isolated waifs which have wandered so far from their native haunts, in nowise lessens the chance of the species' re-appearance another year, and it would certainly seem more rational that they should be exhibited to scores of people who can admire their beauties, rather than that one or two individuals should have the privilege of observing them for a brief half-hour through a pair of field glasses.

The Wild Birds' Protection Act has done a great deal towards maintaining the numbers of the

great mass of the commoner British birds, some of which have undoubtedly increased since the establishment of a close season. Under this Act, County Councils have authority to extend the prohibited period, and to afford protection throughout the year to any species in need of it.

Bird collecting, if carried out with discretion, is not likely to cause essential harm to our native avifauna. In addition to their intrinsic interest, collections of birds, form interesting momentoes of many a healthful and enjoyable outing, and can never fail to delight the collector whenever he looks at them.

In the following pages only the usual method of setting up a bird has been described, and no information is given as to the various ways of mounting birds as wall screens and so forth, as no real scientific end can possibly be achieved by destroying bird life for mere decorative purposes.

Chapter II.

GENERAL REMARKS.

There are few objects, which to the scientific eye, look more unsightly than a badly-stuffed bird; consequently no amount of trouble should be considered too great to achieve the best results; more especially since it is the duty of all who destroy bird life, to make the best possible use of their 'trophies.' The fault with so many stuffed birds is that they *look stuffed.* There is generally discernible some defect such as a stiff posture, a badly-adjusted neck, or a bulging eye, which at once detracts from the life-like appearance of the specimen; and yet these little blemishes, which do so much to spoil the final result, are quite easily avoided if one only takes sufficient care.

There is no royal road to success in any form of art, and in this branch, as in every other, the student must serve before he can rule. Do not expect, therefore, to become an adept, without first experiencing frequent disappointments. The skinning and stuffing as will be seen hereafter, are largely mechanical operations, proficiency in which is soon attained by anyone gifted with average dexterity of finger and thumb. It is on the amount of animation and vitality that you can infuse into your specimen during the mounting or "setting up," that the success of your efforts as a whole so

largely depends; and the enormous importance of attention to detail at this stage cannot be too strongly emphasised. To attain the best results, it is essential that the operator should have a keen observation of nature, coupled with a certain amount of artistic perception. Without these qualifications the worker, however well grounded in technical ability in other respects, may be a complete failure at mounting, or in other words, he may be totally incapable of imparting those final touches to the specimen, which make all the difference between listlessness and life. The goal to strive towards is the living impression of your bird as a whole, and not merely a life-like head (say) with the rest of the specimen looking distinctly mummified. It is useless to know the various parts of the animal frame, unless you understand how they behave in action. One in fact should know a bird so well as to be able to set it up in any attitude without the loss of any of its characteristics. Do not be afraid of indulging in varied and striking postures, as nothing looks so stereotyped as a collection of birds reduced practically to one conventional attitude.

It is impossible from mere description to reproduce faithfully the natural attitudes of birds. These, of course, are best learned from nature, but where this is not possible, as in the case of most rarities, pictures by capable artists such as Thorburn and Lodge, may be studied with advantage. Do not, however, be persuaded to copy the work of another Taxidermist, as this often involves a repetition of mistakes already made. Furnish yourself

with a notebook, and make copious notes, and sketches where possible, of everything that appears to be typical and essential. In a short time you will probably have acquired considerable knowledge of many characteristics that had previously escaped your observation, and which no amount of theorising could have taught you, besides gaining a good deal of confidence, or faith, in yourself. It is only by persistent and patient study that success is finally attained, and the greater your knowledge of nature, the better your work will be.

Chapter III.

IN THE FIELD.

It may not be out of place to refer here to one or two points in connection with the collecting of specimens, and the requisite care of them in the field.

With regard to guns, what are popularly known as collectors' guns, are all very well provided you intend confining your collection to Finches, Warblers, and so forth. For general collecting, however, something more serviceable is required. Undoubtedly the best weapon for all-round shooting is a well-built 12 bore, and it will generally be found more profitable to secure a second-hand gun of good make, than to invest in a brand new weapon of inferior workmanship.

As regards shot, it is well to avoid large sizes where possible, as they are apt to mash a bird, and often render it worthless for stuffing purposes. No. 7 will be found a useful size for an average day's outing. It will account for any bird up to the size of Curlew or Duck, when one is shooting over ground where birds are easy of access. In cases, of course, where cover is scanty, and one is compelled to fire at long ranges, a heavier shot will be required. Again some birds are harder to " bring down " than others : a Heron for instance will often

fall at a shot that a Grey Goose would laugh at. It is advisable, therefore, to have your cartridges loaded with two or three sizes of shot.

Many sportsmen when strolling out for "a crack at Ducks," or other casual sport, dispense with the cartridge bag, and stow away the cartridges in their pockets, which is a very convenient plan, provided that the rain keeps off. It is most annoying, however, to find after a shower that the cartridges in your pockets have bulged, and will not fit in the gun—a state of affairs which, I regret to say, has often given rise to much profanity among careless sportsmen! Therefore if you intend going far afield take a waterproof cartridge bag with you.

In the matter of clothes, the collector should see that the shade of his clothing matches as far as possible that of the background against which the birds are likely to see him. A set of white overalls are useful for slipping on when the ground is covered with snow.

It is not proposed to offer any suggestions as to the various ways of "going to work," as these, of course, will depend largely on the nature of the ground to be shot over. But whether it be walking up one's birds, stalking them under cover of a mud bank, or "laying up" in their line of flight, one should be on the *qui vive* the whole time. This especially applies in the matter of laying up. To sit shivering in a dyke for hours on end in mid-winter, listening to the dreary monotone of a bitter, freezing wind as it wanders over miles of desolate mud flats, when one can touch anything but fire

without feeling it, becomes a trifle boring if nothing comes along, and one's wits are apt to go woolgathering in consequence. It is intensely mortifying to find after a four hours' vigil of this description, that through failing to keep a proper lookout, one has missed the chance of securing the main object of one's quest.

The practical side of shore shooting, or whatever branch of sport you like to name, can only be learned in the bitter school of experience, where one learns more from one's own mistakes than from anything else. It is impossible on paper to teach a man to become a successful "hunter." Strength and endurance, and a quick eye, combined with ability at marksmanship alone, will not make a man successful. Again many a man who shoots well at a mark with a rifle, is a poor shot with a gun; though the converse of this assertion is also true.

Possibly what counts more than all the rest is a knowledge of the habits of the "game" sought after, which enables the shooter to go as if by instinct to where the birds are to be found, because he has calculated beforehand where they ought to be, and his experience and knowledge of their habits do not as a rule mislead him.

A few words about the care of specimens in the field. One's efforts to preserve a bird should commence immediately it is shot. All cripples should be caught and despatched as quickly and carefully as possible, and the less the specimens are pawed about before reaching the skinning table, the better. As soon as a bird is dead, plug its mouth (and in

the case of large birds, the ears and nostrils) with cotton wool, to prevent blood and other matter issuing and staining the plumage. Shot wounds, which have a tendency to bleed freely, should also be plugged. Small birds, such as Warblers, are best wrapped in tissue paper secured by a pin, and consigned to the pocket. With large birds it is a good plan to tie a handkerchief, or similar article round the back and wings (the knot being made on the breast), and to carry them by the legs. In all cases a note should be made of the colour of the iris, and also of the colour of the bill, *tarsi*, and any other parts that will require painting when the bird is dry. This point is best attended to immediately the bird is shot, as the delicate tints of some species fade very rapidly after death.

Chapter IV.

THE OUTFIT.

The implements required for skinning, stuffing, and mounting birds are comparatively few and inexpensive, it being possible to skin a bird with merely a penknife and a pair of scissors, and with the additional help of a pair of pliers to stuff and mount it. The beginner, however, will do well to provide himself with the following articles. A strong surgical scalpel, and a penknife containing two good blades; two pairs of scissors, one pair fine pointed, and the other suitable for cutting bone (a strong pair of nail scissors will answer the purpose, except in the case of large bones which must be cut with pliers); two pairs of pliers (flat and round-nosed respectively); a brain scoop; a stuffing iron (a wire meat skewer with the pointed end flattened out chisel-wise makes a serviceable tool); a pair of wire nippers, and one or two awls of different sizes.

Other requisites are a preservative compound; an assortment of glass eyes; some Plaster of Paris for use during the skinning operation; a quantity of various thicknesses of galvanized iron wire; a supply of tow, cotton wool, and long fine wooden

shavings; a few needles, a reel of cotton, and an assortment of well-seasoned blocks and branches on which to mount the specimens.

Other articles might be added, but when the novice possesses himself of the above, he has practically a complete outfit.

The Plaster of Paris is used to absorb the blood and other matter issuing from the flesh, and it should be used during the whole process of skinning. A good method of applying it is to place it in a canister with a perforated lid, which may be used after the manner of a pepper-pot, the flesh being sprinkled with the contents, wherever the feathers have a tendency to stick. A small jar filled with the absorbent is also useful for dipping the fingers in while skinning.

With regard to preservatives, many Taxidermists have their own recipes, but the old-fashioned one (or a modification of it) still used by many workers is that invented by Becoeur in 1770, which is prepared in the following manner: Take

White soap, 2lbs.
White arsenic, 2lbs.
Camphor, 5ozs.
Chalk, 4ozs.
Salts of Tartar, 2ozs.

Reduce the camphor to a powder in a little spirits of wine. Then shred the soap into an old saucepan, add just sufficient water to dissolve it, and stir over a slow fire until nicely dissolved. Add the chalk and salts of tartar (still stirring), and when

thoroughly blended take the mixture off the fire; then stir in the arsenic, and finally the camphor, the last ingredient being added when the mixture is nearly cold. This mixture is, of course, deadly poison, and therefore the utensils used in its preparation should never be employed for any other purpose. When using, it should be worked up to a lather of the consistency of thick cream, and applied to the inside of the skin with a hog's hair brush.

Corrosive sublimate (bi-chloride of mercury) dissolved in spirits of wine, is another preparation. It is an excellent preservative, and has the advantage of being much cleaner to use than arsenical soap. The solution should be reduced to just such a strength, that when a black feather has been dipped in it no sediment is discernible when the spirit has evaporated. It is also a powerful poison, and great care should be exercised in its use.

For the benefit of those who do not care to tamper with poisons, I give two perfectly harmless compositions, invented by Mr. Montague Browne. The one, popularly known as Browne's Preservative Soap, is prepared as follows:— Take

Whiting, 1½lbs.
White curd soap, ½lb.
Chloride of lime, ½oz.
Tincture of musk, ½oz.
Water, 1 pint.

Shred the soap and boil it with the whiting and water, stirring till thoroughly mixed. When the mixture attains the consistency of thick cream, take

it off the fire and add the chloride of lime, keeping the head away to avoid the obnoxious fumes which are given off. When cold, stir in the tincture of musk. This is a good preservative soap, is very cheap, and if stored in well-stopped jars, will keep for an indefinite period.

The other is in the form of a powder. Take

Burnt alum, 8ozs.
Tannin, 1oz.
Red pepper, 1oz.
Naphthaline, 1oz.

Thoroughly mix the above ingredients, and keep in a well-stoppered jar. This mixture, which should be rubbed into the skin on the inside, answers well for birds and small mammals, and is useful for sprinkling on the skin after applying a preservative soap.

As regards eyes, the most useful sizes are: No. 3, Finches; No. 5, Thrushes; No. 7, Jackdaws; No. 9, Crows; No. 11, Gulls; No. 13, Herons; No. 15, Owls. A gross of assorted colours and sizes may be had from any of the London dealers for a few shillings. Small birds, such as Tits, Warblers and Finches, are quite suited with black eyes; but with larger birds, the colour of the iris must be matched. Some workers procure uncoloured eyes, or "flints," and colour them as required.

The following are approximately the sizes of wire required for the legs: No. 23, Warblers; No. 21, Finches; No. 19, Thrushes; No. 16, Jackdaws; No. 13, Crows; No. 10, Herons; No. 8, Geese. As explained in Chapter VI. the leg wires are always a trifle thicker than the body wire.

Chapter V.

SKINNING.

The beginner will doubtless find the skinning process a little irksome at first, but the knack of overcoming the most awkward parts is soon acquired with practice. Do not hurry the operation, as haste often leads to stretching, or even tearing the skin, which are the first things you want to avoid. The skin, in fact, should be *pushed,* rather than pulled, off the flesh.

It is not advisable to operate on freshly-killed specimens owing to their tendency to bleed rather freely. Time, therefore, should be given to allow the blood to coagulate. A couple of days in average weather is a convenient time to leave a bird before commencing to skin it.

Should the specimen have been soiled by blood oozing from the shot wounds, the stains may be removed by a piece of wadding soaked in benzoline, which should be gently drawn over the injured parts in the direction of the feathers. When the stains have been removed, cover the damp parts with Plaster of Paris, and then leave them until they are dry, when a few sharp taps with a piece of wire will free the feathers from the plaster, and the bird will appear quite clean, if the operation has been carried out properly. This cleaning process is perhaps

better left until the specimen is skinned, otherwise a second treatment may be necessitated by the feathers coming in contact with juices during the skinning, though this can generally be obviated by applying pieces of paper to the inside of the skin as the operation proceeds.

Before actually commencing to skin, the usual measurements, viz., the entire length of the specimen (from tip of bill to end of tail), and length of wing (from carpal joint to end of first primary) in inches and tenths, should be taken and recorded. In the case of Waders it is advisable to note also the length of bill (from base to tip of upper mandible) as some interesting variations, dependent largely on age and sex, are met with, in this connection, from time to time.

Assuming that everything is now ready for a start, lay your bird on a sheet of newspaper, and replug the mouth with fresh cotton wool. Next tie the mandibles firmly together with a piece of thin string(which should be passed through the nostrils, leaving a length of eight or ten inches attached, the use of which will presently appear. Now with the round-nosed pliers break each *humerus* close to the body, so as to cause the wings to lie open and so be out of the way. (In the case of large birds the wing bones are best broken with a ruler or blunt stick against the table's edge). Having done this, lay the bird on its back, and part the feathers from the breast-bone to the vent; then with the scalpel make a small incision in the skin at the end of the breast-bone, and continue the cut down to the vent with the

fine-pointed scissors. In doing this great care must be taken, for if the thin wall of the abdomen is pierced, the intestines will protrude and injure the plumage. Now begin to part the skin from the flesh, by taking one edge between the thumb and forefinger, and with the knife blade (or a piece of wire in the case of small birds) gently press the flesh away from the skin, loosening it as far as possible down the side of the body, afterwards proceeding with the other side in a similar way.

All this time you should have been sprinkling the flesh freely with the Plaster of Paris.

The skin now being separated from the flesh on each side of the body, the legs may be attended to. Take hold of the leg on the outside, and push it in, until the " knee " is well exposed. Separate the *tibia* and *femur*, and then by means of the foot draw back the *tibia* into its place, to be dealt with as hereafter described.

Repeat the operation with the other leg.

The tail must now be severed from the body at the last caudal vertebra. To do this, place the bird on its head so to speak, and press back the tail with the left hand, then cut through the lower portion of the abdomen just above the root of the tail, taking care not to penetrate the loose skin on the sides of the body, which should be held out of the way by the thumb and forefinger of the left hand. When the vertebra is reached snip it through with the nail scissors. The beginner will probably find this rather hard to understand, and difficult to perform,

but a little experience in skinning will soon remove the trouble.

Having freed the tail, proceed very cautiously along the back, gradually working round the body until the wings are reached. The latter must be severed by cutting through the flesh and ligaments at the fractures made previously with the pliers. Then by gently working the skin over the neck, the base of the skull will appear.

Great care and patience must be exercised in skinning the head, as it is the most delicate part of the operation, and the stage at which a tear, if serious, can seldom be satisfactorily remedied. At this point, the skinning should be helped by a series of slight cuts until the base of the bill is reached.

Soon after passing the base of the skull, progress will be checked by arrival at the ears. The skin must be freed, by lifting it out with an awl or the point of the knife. (In the case of small birds the skin may be scratched out by the finger nail). Gradually skinning a little further, progress will again be stopped, this time by two dark patches appearing, near the summit of the skull. These are the eyes, and they must be passed by carefully cutting the membrane which connects the eyelids with the orbits, at the same time gently drawing the skin towards the base of the bill.

Having safely carried the skinning to the bill, dig out the eyeballs by means of the brain scoop, or the scissors blades slightly opened, taking care not to burst them, or the vitreous humours will soil the head feathers.

Cut off a sufficient portion of the *occiput* to expose the base of the brain, and remove the tongue, floor of the mouth, and the plug of cotton wool previously introduced. The neck and body thus separated from the *cranium* should be laid aside, but not thrown away. Now take hold of the skull, and with the nail scissors snick away the back portion of the palate, being careful not to interfere with the articulation of the lower jaw. You will then be able to extract the brain by means of the scoop.

The skin being now reversed this is the most convenient time to remove all fat, and any bits of flesh which adhere to it. In scraping off the fat, etc., it will be found easier to work upwards from the tail, as the roots of the feathers lie in that direction. When divesting the tail of the flesh, care must be taken not to cut through the root, or the feathers will fall out.

Having thoroughly cleaned the skull, paint it, and also the skin of the head and neck, with a preservative, and then fill up the eye-orbits with cotton wool, and the cavity of the skull with chopped tow. In the case of large birds the cheeks also will require stuffing.

Some Taxidermists use putty for filling the orbits, but it cannot be recommended, particularly with birds of delicate plumage, as the oil of the putty is liable to cause a disagreeable stain eventually which cannot be easily removed.

Now with the string attached to the bill gently draw back the skull into its proper place. This will

be found quite a simple matter with some birds, while with others a good deal of coaxing will be necessary. If the skull sticks, push it forward with the thumb, and at the same time gradually work the skin back with the fingers of both hands. Above all things don't tug with the skin in one hand and the string in the other, as this procedure often causes the head to leave its " moorings." When the skull has been returned the head feathers will be very ruffled, but a little manipulation will soon put them in order. A knitting needle inserted through the eye, and passed along the skin, helps the plumage to resume its natural state.

Now turn to the wings. Seize the bone (i.e., the splintered *humerus*) in one hand, and with the other hand, skin down to the carpal joint. All will go well until the first joint is reached, and then some difficulty will be found in detaching the larger feathers from the *ulna*. In the case of most birds this is overcome by applying gradual pressure with the thumb nail to the roots of the feathers. (With large birds the wing is best opened on the underside, cleaned, preserved and stuffed, and then neatly sewn up again). Having reached the carpal joint, cut off the *humerus,* and strip the *ulna* and *radius*. To the loop thus formed by the bones tie a piece of string or thread, according to the size of the subject, anoint the skin and bones with a preservative, and wrap the bones with just sufficient tow to replace the flesh. (In the case of small birds it is not necessary to insert stuffing in the wing). The

wing is then restored to its original position, and the feathers smoothed out.

The legs are served the same way as the wings, except that no tow or string is introduced.

Now with the strings draw up the wing bones until their ends are slightly less distant than the width across the back, and fasten them in that position. Paint the root of the tail and body portion of the skin, with a preservative, and finish off by straightening out the plumage.

In the case of some birds, the skin of the neck will not pass over the skull. Woodpeckers, Geese, Ducks and Grebes are examples of this class. With these birds a cut is made on the top of the head, sufficiently large to admit the skull (the neck having previously been cut off as close to the skull as possible), and the skinning carried out as before described, the incision being neatly sewn up when the operation is completed.

White-fronted birds are often spoiled by their being opened down the breast, for sooner or later a greasy line makes its appearance where the bird has been sewn up. These birds, therefore, are best skinned from under the wing, a process practically the same as that just described, but if anything a little more difficult. The incision is made on the side most damaged. The wing is severed, and by skilful handling the skin freed from the breast and shoulders, and the neck cut off. The other wing is then separated, and the skinning carried to the legs, which are severed at the " knees." Careful skinning

over the stomach and lower portion of the back, takes the operator to the tail, which is cut off, and the body thus liberated. The head, wings and legs are treated as before explained, and the skin finished off in the usual way.

Chapter VI.

STUFFING AND MOUNTING.

We now come to the more difficult task of stuffing and mounting the specimen—the stages, in fact, at which a bird is either made or marred.

There are various ways of stuffing and wiring birds, by which more or less satisfactory results may be obtained. The following, however, is perhaps the best working method, and is the one substantially employed by most Taxidermists at the present day :—

First place your skin on a clean sheet of paper, then with the stuffing iron, pass a small piece of tow up the neck to rest against the base of the skull, and another piece into the throat so as to form a continuation between the head and neck. This done, cut a piece of wire of a thickness proportionate to the size of the specimen, and about twice the length of the latter, and point it at one end by cutting it obliquely with the wire nippers. Next make an artificial body similar in size to the actual one which you previously laid aside to serve as guide. To do this take a small quantity of shavings, and roll them into an egg-shaped, or elongated ball, which should be slightly smaller than the bird's body. Pass the wire through the body, and secure it by bending over the blunt end and bolting it

firmly into the body. Wind a little tow round the shavings, and continue the wrapping towards the pointed end of the wire to form the neck, finishing off with a wrapping of thread. A lighted match passed rapidly over the artificial body will trim off any straggling bits of tow and give a neat finish. It should be remembered when making the artificial body, that it is better to err on the small side, since it will generally be found easier to add stuffing than to remove it.

Now introduce the body into the skin, passing the wire up the neck and through the skull, so that it projects beyond the eyes, and then work the skin into position round the body. Next, cut two pieces of wire a little shorter, but a trifle thicker than the body wire. Point them with the wire nippers (or with a file in the case of stout wires) and pass them through the soles of the feet, up the back of the legs and through the body. The projecting ends are then bent over, firmly twisted together with the pliers, and clamped down against the body. The beginner will at first experience some difficulty in getting the wire past the heel, but he will soon overcome this with practice. Keep the legs perfectly straight when inserting the wires. The latter, if rubbed with soap, will be found to run more easily. As soon as the heel has been passed, turn the thigh inside out and pull the wire through with the pliers.

In cases where the thigh is shown to any appreciable extent in nature, stuffing in the form of tow

wound round the bone and wire, will be necessary. The majority of birds, however, show so little thigh that the wire alone is ample stuffing for the part usually exposed, and in such cases it is only necessary to retain half the thigh bone.

When the wiring of the legs is complete, introduce stuffing (chopped tow) if necessary, into the flanks and breast, and then sew up the skin, commencing on the breast and finishing at the tail. The stitches should be taken from the inside, and care used not to draw in the feathers. Finish off by pressing the body into shape, leaving the back nicely sloped, and the breast well rounded.

The bird is now ready for mounting. Assuming it to be a Partridge, take a block of wood about five inches square, and pierce a couple of holes in it to receive the leg wires. Push the wires through the holes, and bolt them to the underside of the block. Insert the artificial eyes, neatly pulling the lids over them, but be careful not to allow them to protrude in an unnatural manner. In certain cases of a fracture, or enlargement of the skin, it may be necessary to use gum to hold the eyes in position.

Now attend to the pose. This point is the most significant of all, for as before intimated, on what you make of it, depends so largely the success of your efforts as a whole. A knowledge therefore, of the structure and habits, etc., of birds, is invaluable at this stage. When fixing the pose, see that the legs are not too forward or too backward; in other words look well to the centre of gravity.

Remember that perching birds, such as Thrushes, Warblers, etc., have their "heels" closer together than their feet.

Nightjars sit along the bough—not across it.

Tree Creepers and Woodpeckers when tree-climbing have their tails resting on the bark.

Most Raptorial birds show only the foot when resting.

Ducks and many other web-footed birds are pen-toed.

Gulls when resting have their legs quite straight.

Birds in flight, in addition to having their wings extended, have the tail spread, and (except in a few cases) carry their legs close to the body with the toes shut.

The above are examples of a few characteristics, which, when appropriately reproduced, go a long way towards the making of a bird.

When satisfied with the position and angle of the legs, adjust the head and neck. If the bird is being set in an attitude of repose, press the head down the neck wire until it rests between the shoulders. In representing a bird on the alert, the neck should obviously be extended, but avoid a common fault with beginners—that of making the neck too long. When posing the head, a slight turn and tilt will give a lot of life.

The wings and tail now require attention. Lift up the wings and pin them in their normal positions

with a couple of pointed wires, which should be passed through the first primary into the body, leaving about an inch of wire projecting on each side.

To extend the wings as shown in flight, insert a pointed wire just below the carpal joint, and then pass it along the inside of the wing below the *ulna* and *radius*. When these bones have been passed, raise the wing to the desired angle and force the wire into the body. A single wire is usually sufficient to support the wing, but an additional one may be passed under the wing, if necessary, as a temporary support until the bird is dry. The supporting wire may be inserted under the wing on one side, pushed right through the bird, and bolted into the body on the other side, where the wire is hidden by drawing the feathers over it. Another method of supporting the specimen is to fasten the wire round the artificial body (before inserting the latter in the skin), the projecting end being bent down so that it comes out under the tail when the bird has been sewn up. The wing feathers are best fixed in position by pinning them between strips of thin card.

The tail may be spread, or closed, as desired, on a fine wire passed through the quills (or it may be pinned between strips of thin card) and supported by another wire passed into the body through the butt.

After cutting off the head wire close to the skull, arrange the plumage very carefully with a needle. This done, begin to bind the specimen with thread, gently fastening down any

feathers that have a tendency to rise. The scapulars and wing coverts will generally be found the troublesome ones, but whatever position is given to the feathers in the binding, will be retained when the bird is dry. Before beginning the wrapping process it is a good plan to insert a wire in the back of the specimen, and another one in the breast (making with the wing wires four projections in all), and then, commencing on the back, to work in a zigzag fashion from wire to wire.

When the binding is finished, make a final inspection of your bird before laying it aside to dry, and see that the expression of the eyes, if it has been altered during the posing of the head, is thoroughly rectified—there is enormity in a lifelike eye. The bird should then be put away in some place where it will be free from the attacks of insects until it is dry or ready for casing. A cupboard made after the fashion of a wire gauze meat safe makes a good drying-house. The drying period varies according to the size of the specimen and the condition of the atmosphere, and may last a fortnight or longer. The thread is, of course, removed when the bird is dry, and all projecting wires are cut off. The colour of the bill, *tarsi,* etc., should be restored with a thin coat of good oil paint, and when dry treated with copal varnish well thinned with turpentine.

Natatorial species require v-shaped pieces of stiff card pinning between the toes, exactly fitting the spaces. If this precaution is not taken, the webs will shrivel and look most unnatural when dry.

Birds are best displayed in dust-proof cases containing natural surroundings. A few hints on the subject of casing will be found in the next chapter.

If the specimen is intended to be stored in a cabinet, it is merely stuffed with an artificial body, the wings fixed in position, and the legs crossed and tied together. This system has little to recommend it, beyond the fact that specimens thus treated admit of ready examination and are easily stored. When travelling, however, and time and space are considerations, it is the best way of dealing with them, since they may be relaxed, and set up at any future time, though it should be remembered that a relaxed skin dries very quickly, and can seldom be mounted so satisfactorily as what is familiarly known as a " green " skin.

A word about relaxing. It is useless to try and do any good with a relaxed specimen until the skin it got thoroughly under control. The smaller skins are soon relaxed by wrapping them in a rag, and burying them in a box of clean damp sand until the wings and toes can be spread and closed with ease. The period of relaxation varies with the size of the bird, and may last from one to four days.

The above method answers well with birds up to a medium size, but it is not so good with large specimens. With the latter, better results are obtained by immersing them in a bath of luke-warm water, to which a little vinegar has been added. When the skin has been well-soaked it should be

rubbed briskly on the inside with a smooth piece of wood, so as to stretch the fibres and render the skin quite pliable; afterwards dry with Plaster of Paris. There is always the risk of losing a few of the head and neck feathers during the process, as they are liable to rot out if submerged too long. These parts, therefore, should be steeped for a shorter time than the body.

Chapter VII.

CASING.

An uncased bird soon deteriorates, and is always liable to the attacks of insects, therefore the sooner it is cased the better. The case adopted is largely a matter of choice, provided that it is dust-proof. Those most commonly used are the old-fashioned round and oval shades with wooden mounts; the box case with glass front; the glass-ended case, with glass ends and front, and wooden top back and bottom, and the all-glass case, with four glass sides and glass top, bound together with strips of black linen and mounted on a wooden stand. The two last are recommended for preference, the glass-ended case being perhaps the more popular of the two, as it enables the worker to aim at making the show side of the specimen perfect, rather than both sides moderate, and it also admits of a suitable background being painted in.

As regards the artificial rockwork, this is best made on a false bottom and afterwards fastened in the case by screws driven in from underneath. Many people make the rockwork of brown paper, moulded over a bedding of shavings or paper. Better results, however, are to be got out of cardboard boxes. These should be cut down as desired, rammed with paper, and tacked down bottom upwards. When

the boxes have been crumpled into the required shapes, join up the valleys, etc., by glueing on strips of *papier maché* or cotton wool. When dry, paint the whole with a liberal coating of hot glue and Plaster of Paris mixed to the consistency of thick cream, and finally cover with fine dry sand. Any sand not absorbed by the glue is afterwards thrown off, and the rockwork coloured with oil paint well thinned with turpentine. Any parts intended to look wet should be varnished.

Peat is sometimes used for rockmaking, on account of its rigid nature and the ease with which it can be moulded; but there is always a danger in introducing it owing to the possibility of its containing insect life. It is nailed down, carved into the required shape, and then covered with plaster, etc., as above.

When making the rockwork it is a good plan to have a rough sketch at hand to work by, and to commence at the spot where it is intended to fix the specimen.

In cases where branches are used, they should be well dried, and afterwards painted with turpentine in order to destroy any insect life they may contain. If the turpentine is tinged with green the appearance of the branches is improved.

Ferns, grasses, lichens, etc., may be introduced where appropriate. They should be dried and then coloured with oil paint.

Seaweeds must be well washed and afterwards varnished if intended to look wet.

When the rockwork is finished, with the bird or

birds in position, it should be fixed in the case as before described, the glass being afterwards fastened in by strips of paper coated with brunswick black.

Where the glass-ended case is used, the general effect is much improved by painting in a nicely-toned background in distemper.

A note should be kept of the name and sex of each species, the locality, date when taken, and any other points (such as contents of gizzard) that may be of interest. These notes are very important from a scientific standpoint. They should never be omitted.